

WHAT IS CLAIMED IS:

- 5        1. A method for treating disorders regulated at neuronal nicotinic acetylcholine receptors (nAChRs) which comprises administering to a patient in need of such treatment a therapeutically effective amount of an  $\alpha$ -conotoxin peptide having the general formula

Xaa<sub>1</sub>-Xaa<sub>2</sub>-Cys-Cys-Xaa<sub>3</sub>-Xaa<sub>4</sub>-Pro-Xaa<sub>5</sub>-Cys-Xaa<sub>6</sub>-Xaa<sub>7</sub>-Xaa<sub>8</sub>-Xaa<sub>9</sub>-Xaa<sub>10</sub>-Xaa<sub>11</sub>-Xaa<sub>12</sub>-Cys (SEQ ID NO:1)

10        wherein Xaa<sub>1</sub> is des-Xaa<sub>1</sub>, Tyr, mono-iodo-Tyr or di-iodo-Tyr, Xaa<sub>2</sub> is any amino acid, Xaa<sub>3</sub> is any amino acid, Xaa<sub>4</sub> is any amino acid, Xaa<sub>5</sub> is any amino acid; Xaa<sub>6</sub> is any amino acid, Xaa<sub>7</sub> is any amino acid, Xaa<sub>8</sub> is any amino acid, Xaa<sub>9</sub> is des-Xaa<sub>9</sub> or any amino acid, Xaa<sub>10</sub> is des-Xaa<sub>10</sub> or any amino acid, Xaa<sub>11</sub> is des-Xaa<sub>11</sub> or any amino acid and Xaa<sub>12</sub> is des-Xaa<sub>12</sub> or any amino acid or a pharmaceutically acceptable salt thereof, with the proviso that when the disorder is small cell lung carcinoma, then the  $\alpha$ -conotoxin peptide is not a peptide having an amino acid sequence set forth in SEQ ID NO:2 or SEQ ID NO:13.

- 15        2. The method of claim 1, wherein Xaa<sub>1</sub> is Tyr, mono-iodo-Tyr or di-iodo-Tyr.

- 20        3. The method of claim 1, wherein said disorder is a cardiovascular disorder.

- 25        4. The method of claim 1, wherein said disorder is a gastric motility disorder.

- 5        5. The method of claim 1, wherein said disorder is urinary incontinence.

- 25        6. The method of claim 1, wherein said disorder is nicotine addiction.

7. The method of claim 1, wherein said disorder is a mood disorder.

8. The method of claim 1, wherein said disorder is small cell lung carcinoma.

- 30        9. The method of claim 1, wherein said nAChR is an  $\alpha 3\beta 2$ -containing nAChR.

10. The method of claim 1, wherein said nAChR is an  $\alpha 3\beta 4$ -containing nAChR.

11. The method of claim 1, wherein said nAChR is an  $\alpha$ 7-containing nAChR.
12. The method of claim 1, wherein said  $\alpha$ -conotoxin peptide is selected from the group consisting of:  
Gly-Cys-Cys-Ser-Leu-Pro-Pro-Cys-Ala-Leu-Asn-Asn-Pro-Asp-Tyr-Cys (SEQ ID NO:10);  
Gly-Cys-Cys-Ser-Leu-Pro-Pro-Cys-Ala-Ala-Ser-Asn-Pro-Asp-Tyr-Cys (SEQ ID NO:11);  
Tyr-Gly-Cys-Cys-Ser-Asn-Pro-Val-Cys-His-Leu-Glu-His-Ser-Asn-Leu-Cys (SEQ ID NO:3); and  
Gly-Cys-Cys-Ser-Asn-Pro-Val-Cys-Phe-Ala-Thr-His-Ser-Asn-Leu-Cys (SEQ ID NO:4).
13. The method of claim 12, wherein at least one of the Pro residues is replaced with hydroxyproline.
14. The method of claim 12, wherein a Tyr residue is incorporated on the N-terminus.
15. The method of claim 14, wherein the Tyr residue is substituted with one or two iodines.
16. The method of claim 1, wherein said  $\alpha$ -conotoxin peptide has the formula Xaa-peptide, wherein Xaa is Tyr, mono-iodo-Tyr or di-iodo-Tyr and peptide is selected from the group consisting of (a) a peptide having the amino acid sequence set forth in SEQ ID NO:5, (b) a peptide having the amino acid sequence set forth in SEQ ID NO:7, (c) a peptide having the amino acid sequence set forth in SEQ ID NO:8, (d) a peptide having the amino acid sequence set forth in SEQ ID NO:9, (e) a peptide having the amino acid sequence set forth in SEQ ID NO:12 and (f) a peptide having the amino acid sequence set forth in SEQ ID NO:13.
17. The method of claim 16, wherein at least one of the Pro residues in the peptide is replaced with hydroxyproline.
18. The method of claim 16, wherein a Trp residue in the peptide is replaced with bromotryptophan.